

REMARKS/ARGUMENTS

Reconsideration of this application is requested. Claims 15-33 will be active in the application subsequent to entry of this Amendment.

The claims have been amended in order to more particularly point out and distinctly claim that which applicants regard as their invention and to direct their claims to preferred aspects of the disclosure. In addition, applicants submit with this response the Evidentiary Declaration of the senior inventor Ikenishi as well as a concurrently filed Information Disclosure Statement. Also, an Information Disclosure Statement was filed on January 12, 2005. Both IDSs require consideration, the relevant fees being paid herewith.

Referring to the amendments made to the claims, independent claim 15 is above amended to specify that the glass contains, by mol%, 1 to 25 % of B_2O_3 , 1 to 20 % of Al_2O_3 and 5 to 15 % of Li_2O and that the glass has a specific modulus of 30×10^6 N·m/kg or higher. Independent claims 21, 22, 23 and 24 are amended to add limitations that the glass substrate contains, by mol%, 1 to 20 % of Al_2O_3 and 5 to 15 % of Li_2O and that the glass substrate has a specific modulus of 30×10^6 N·m/kg or higher. These amendments are supported in the originally filed specification. For the contents of B_2O_3 , Al_2O_3 and Li_2O , see paragraph [0026] – [0027], and for the specific modulus, see paragraph [0051].

By the amendments discussed above, the glass defined in claim 15 and the glass substrates defined in claims 21, 22, 23 and 24 contain, by mol%, 1 to 25 % of B_2O_3 , 1 to 20 % of Al_2O_3 and 5 to 15 % of Li_2O and have a specific modulus of 30×10^6 N·m/kg or higher.

Independent claims 21, 22 and 23 are also amended to specify the presence of R'_2O of “28 % or less”, and in independent claim 24, the content of R'_2O is “40 % or less”. The “or less” is found in paragraph [0027] and elsewhere in the specification.

In order to round out the protection afforded to applicants, a new claim is presented. Since U.S. Patent 6,818,576 issued from the parent application of the present application has no claim directed to “an information recording medium”, new claim 33 is added directed to “magnetic information recording medium” comprising the glass substrate of any one of claims 21 to 24 free of the limitation of having no chemical strengthened layer.

The issues specifically raised in the outstanding Official Action all relate to rejections based upon prior art. In item 1 it is argued that claims 15-29 and 32 are anticipated by the U.S.

patent to Yamamoto U.S. 6,577,472 while in items 2-4 of the Official Action various other claims are rejected based primarily on the Yamamoto patent as the primary reference taken with other secondary references. These rejections are respectfully traversed having regard to the amendments made to the claims, as discussed above, as well as the attached Evidentiary Declaration.

The Yamamoto reference in claim 4 discloses a substrate for a magnetic disk which substrate is formed of a glass containing, by weight %, 50 to 80 % of SiO_2 , 0 to 15 % of B_2O_3 , 0 to 20 % of R_2O (R = alkali metal element), 3 to 10 % of Ln_2O_3 (Ln = rare earth element), 0.5 to 15 % of Al_2O_3 and 1 to 30 % of CoO . As specific embodiments of the above glass, Yamamoto reference discloses substrates formed of glasses having compositions Nos. 1 to 44 in Tables 1 and 3. However, the Yamamoto reference discloses nothing concerning any other glass different from the above glasses, and Yamamoto reference neither discloses nor suggests any substrate formed of a glass having a co-presence of SiO_2 , B_2O_3 , Al_2O_3 and Li_2O .

Further, the Yamamoto reference describes none of the specified and claimed physical properties such as Young's modulus, density and specific modulus of the glass constituting the substrate. The senior inventor Mikio Ikenishi has carried out a duplicate experiment of the glass of Yamamoto reference. The duplicate experiment has shown that the specific modulus of the glass disclosed in Yamamoto reference does not reach $30 \times 10^6 \text{ N}\cdot\text{m}/\text{kg}$. For details, see the Evidentiary Declaration attached hereto made March 23, 2005.

In the present invention, the glass compositions are shown by mol%, while in the Yamamoto reference, they are shown by weight %. The glass composition Nos. 1 to 44 in Tables 1 and 3 of the Yamamoto reference were converted from weight% to mol%, and Tables Ia ~ Ig attached hereto to show the results for reference purposes.

Table II attached hereto shows densities, Young's moduli and specific moduli of glasses in Examples 39 to 80 of the present specification which are included within the scope of amended claims.

Table II demonstrates that all of these glasses have a specific modulus of $30 \times 10^6 \text{ N}\cdot\text{m}/\text{kg}$ or higher (minimum value : $30.45 \times 10^6 \text{ N}\cdot\text{m}/\text{kg}$). On the other hand, the inventor's Declaration and Table II attached show that the specific moduli of the glass composition Nos. 36

and 37 of the Yamamoto reference do not reach $30 \times 10^6 \text{ N}\cdot\text{m/kg}$, so that it is clear that the present invention produces excellent effects over the invention of Yamamoto reference.

In the outstanding Office Action, it is deemed that the invention of the “information recording medium” recited in independent claim 15 and the inventions of “glass substrate for an information recording medium” recited in independent claims 21, 22, 23 and 24 are anticipated by the Yamamoto reference, so that we counter-argue this point below. Applicants disagree particularly as to the amended claims presented above.

The information recording medium” recited in the amended independent claim 15 has a characteristic feature in that the glass substrate constituting the above medium is “formed of a high-elasticity glass containing 1 to 25 mol% of B_2O_3 , 1 to 20 mol% of Al_2O_3 and 5 to 15 mol% of Li_2O and having a specific modulus of $30 \times 10^6 \text{ N}\cdot\text{m/kg}$ or higher”.

Further, the invention of “glass substrates for an information recording medium” recited in each of the amended independent claims 21 to 24 has a characteristic feature in that the glass substrate itself is formed of a high-elasticity glass containing 1 to 25 mol % of B_2O_3 , 1 to 20 mol% of Al_2O_3 and 5 to 15 mol% of Li_2O and having a specific modulus of $30 \times 10^6 \text{ N}\cdot\text{m/kg}$ or higher”.

On the basis of these specific glass compositions, there can be provided glass substrates having a high specific modulus and high fracture toughness, which are suitable for high-speed rotation of an information recording medium.

On the other hand, the Yamamoto reference does not disclose any substrate formed of a glass having a glass composition containing predetermined amounts of B_2O_3 , Al_2O_3 and Li_2O that are co-present as glass components, and the Yamamoto reference neither discloses nor suggests any thought that such a glass composition can provide a glass substrate having a high specific modulus and high fracture toughness.

Therefore, the present inventions as defined in the amended independent claims 15 and 21 to 24 differ from the invention of the Yamamoto reference. There is no anticipation.

The Yamamoto reference does not at all disclose any finding required for leading to the present inventions, so that the present inventions are not at all obvious over the invention of Yamamoto reference.

For the same reasons as given above, the present inventions defined in the amended independent claims 15 and 21 to 24 are novel and patentable over the disclosures of invention of the Yamamoto reference.

In addition, claims 16 to 20 dependent upon the independent claim 15 and claims 25 to 32 dependent upon the independent claims 21 to 24 are rejected as being unpatentable over Yamamoto reference alone or over Yamamoto reference in view of Fukushima reference, Saito reference or Zou reference. However, the independent claims are remarkably different from Yamamoto reference, so that these dependent claims are also patentable.

Information Disclosure Statements

Please consider this response taking into account the concurrently filed IDS. In the examination of the corresponding Japanese patent application, JP-A-9-52729 has been cited. The IDS includes a copy and a JPO computer translation of it. The relevant fee [see 37 C.F.R. §1.97(c)(2)] to secure entry and consideration of this IDS is paid herewith.

As the examiner will quickly see, the invention disclosed in JP-A-9-52729 relates to a “scratch-resistance glass”, and JP-A-9-52729 does not disclose any use of this glass as a glass substrate for an information recording medium.

Attention is also directed to an IDS filed on January 12, 2005 (after the mailing date of the current Official Action). The relevant fee [see 37 C.F.R. §1.97(c)(2)] to secure entry and consideration of this IDS is paid herewith.

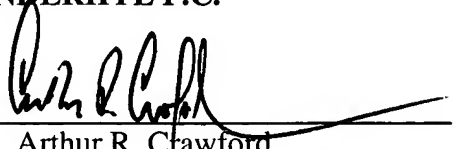
IKENISHI, M. et al.
Appl. No. 10/810,896
March 28, 2005

For the above reasons it is respectfully submitted that claims 15-33 define novel and inventive subject matter. Reconsideration and allowance are solicited. Should the examiner require further information, please contact the undersigned by telephone.

Respectfully submitted,

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